---------- Forwarded message ----------
From: Mary Bishai <mbishai@bnl.gov>
To: klande@physics.upenn.edu
Date: Thu, 22 Mar 2007 12:09:07 -0400 (EDT)
Subject: Re: Conversation with Chris Laughton (fwd)
Hi Ken,

If you send me your fax number, I can fax you some of the relevant summary pages I got from Chris. I think that one way to offset any argument about costs, is to put in a backup slide which is a separate table with all the extra line items he wanted addressed that you deem reasonable and mention that these costs are being worked on. Do you have numbers now for the exploratory and site investigation costs?

A major sticking point was also this issue of 50% contingency on the current cavern cost estimate. I think conceeding that point will go a long way towards engaging FNAL.

Almost all the complaints about this project I have heard is that its "pie in the sky" because its too long term and too costly. No matter what option is under discussion, the science needs to maximize MW.KT luminosity. For phase II, you can do that by building a proton driver or you can do that by building a large detector. We need to tilt the argument towards building the large detector and a big argument in favor of the large detector vs proton driver is cost. You get more physics per $. But that means your costs have to be believable.

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Mary Bishai Office: 3-181
Associate Physicist Pager:
Brookhaven National Laboratory Tel: 631-344-4877
Bldg 510E, P.O. Box 5000 FAX: 631-344-4741
Upton, NY 11973-5000 E-mail: mbishai@bnl.gov
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On Thu, 22 Mar 2007 klande@sas.upenn.edu wrote:

> Hi Mary,
>
> Thank you very much for this info. Certainly labor costs are a potential
> problem and depend on a number of unknowns. However, if I take Chris'
> guideline and change labor from 25% to 35% of total costs, that adds about $3
> million to a $100 million bottom line. That does not strike me as a "killer".
> The amusing issue here is that I have raised the labor costs several times.
> THe first time was in 2002 before our SAGENAP presentation. Mark Laurenti used
> the standard Homestake costs in Lead. I increased that. Then I increased labor
> costs a second time in 2005 and finally again last year.
>
> Rock disposal must clearly be and is included in our cost estimate. We have an

> upper limit on this cost from SDSTA. Rock disposal costs are very site
> dependent. The costs at Homestake cannot be meaningfully compared with those
> at Soudan. This was one of the issues considered in the site transfer from
> Barrick to South Dakota. In addition to the present plan to dispose of the waste
> rock in the Open Cut, the State Geologist has identified a number of sites with
> a few miles of the mine shaft that could serve as secondary disposal sites. I
> assume that rock disposal will be part of the NSF-SDSTA agreement on DUSEL
> establishment. It effects every experiment and the construction of the entire
> laboratory, not just our experiment.
>
> I do not know how to deal with the MINOS cavern estimate vs final cost except to
> be careful about using CNA cost estimates. A long, narrow chamber is the most
> expensive to construct and the hoist system at Soudan is not well suited to
> rock removal. The assumption that deeper construction is more expensive is
> just not so. Wall support costs depend on the character of the rock much more
> than on the depth of the excavation. The goal at Homestake was to choose the
> strongest, most competent rock for the chamber. During its gold mining days,
> Homestake would routinely drop waste rock to lower levels before raising it to
> the surface because the rock handling equipment at the deeper levels was more
> efficient. Fortunately, the 4850 ft level is a highly efficient rock handling
> level. That was its role during the gold mining days.
>
> As I said yesterday afternoon, I hope we can get the issues focussed on cost. I
> think the low cost per detector volume and more importantly, on cost per
> detected event or even per signal measurement precision cannot not be matched
> by any other detector, in existence, under construction or in dream format.
>
> Ken
>
> Quoting Mary Bishai <mbishai@bnl.gov>:
>
> >
> > Hi Ken,
> >
> > Attached below is the email I sent Milind after my conversation with
> > Chris. In addition to the issues noted below, I also got the following
> > feedback:
> >
> > -Labour costs: In your current estimate you have labour costs are 25% of
> > the total. Chris pointed out that typically labour costs run you about
> > 40%. The Braidwood and Diablo Canyon contractor bids (done by the same
> > company) had the labour costs at 35% of the total project cost. These bids
> > have a summary of costs at the beginning, he recommends we use these as a
> > template. Milind has all the documentation. Even if labour is cheaper in
> > SD- since this is now a federally funded lab, you have to pay them some
> > minimum federally determined amount.
> >
> > -Another of Chris's comments is the Rock removal costs are based on
> > estimates while Homestake was operational and the disposal was a small
> > fraction of the mine operations. Now that Barrack is gone, have you
> > accounted for where you are going to dispose of the rock in your costs? Is

> > the disposal site within the SDSTA's territory. Who is in charge of mine
> > drainage? SDSTA or Barrack?. Will SDSTA charge you extra for that?
> >
> > -One of the main issues with the cost is that the final costs of the MINOS
> > cavern in Soudan was $13M, whereas the initial engineering cost from CNA
> > was $3M, hence the worry that your costs could be a factor of 3 lower than
> > what it will actually cost. The feedback I got from the people involved in
> > NuMI is that they no longer thrust engineering estimates, even from mining
> > companies. There are hidden costs that are not included in the estimates
> > that could be quite substantial. I tried to get the details from Gina
> > Rameika on why the Soudan II costs balloneed and she totally ignored me.
> > You are proposing building 3 53mx53m diametar caverns for $70M even deeper
> > underground than the MINOS cavern (which is at 2700 ft) which was 82m long
> > x 15 meters wide x 15 meters high. Chris seemed to think the cost of the
> > MINOS cavern in Soudan is a good "guideline".
> >
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> > Associate Physicist Pager:
> > Brookhaven National Laboratory Tel: 631-344-4877
> > Bldg 510E, P.O. Box 5000 FAX: 631-344-4741
> > Upton, NY 11973-5000 E-mail: mbishai@bnl.gov
> > ==========
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> > ---------- Forwarded message ----------
> > Date: Tue, 6 Mar 2007 12:18:24 -0500 (EST)
> > From: Mary Bishai <mbishai@bnl.gov>
> > To: Milind Diwan <diwan@bnl.gov>
> > Subject: Conversation with Chris Laughton
> >
> >
> > Hi Milind,
> >
> > I talked to Chris to find out what he wants. He has given me a copy of the
> > Braidwood and Diablo Canyon contractor bids. Chris said to keep in mind
> > that Engineering consultants usually underestimate (because they want you
> > to be happy and come back and pay them $200K for the full thing ;) and
> > they arent going to be liable for it anyway) and that the best cost
> > estimate is from a contractor bid. He is much happier with the latest
> > excel sheet (so no factors of 3-5 like Adam said!) but he wants a few more
> > line items added if they are not already included:
> >
> > -Architectural, Engineering and Construction Management (AECM) - 18-22%
> > this is standard for Fermilab/DOE projects and he suggested talking to
> > Ralph Brown for guidance.
> >
> > -Operation overheads - ?? His question is are we (NSF/DOE) going to pay
> > Homestake mine for the additional use of their hoists, elevators and the
> > extra ventilation costs that building the large caverns will entail? Or
> > will Dave Snyder pay for this out of Homestake operation costs. He thinks
> > Dave Snyder will ask for some payment. This is related to the above item.

> >
> > -Site Investigation (1-3%, 5% maximum of construction cost) this is
> > especially true for the 3 cavern cost.
> >
> > -Exploratory galleries (approx 1%?)
> >
> > -Cavern instrumentation (approx 1%)
> > this is to monitor cavern stability for 50 yrs.
> >
> > -Moblization and demoblization (??$) Since its not an operating mine
> > anymore there is extra overhead entailed in expanding the workforce and
> > then terminating once the construction project is over. Chris feels it
> > would go down better with the funding agencies to have this line items in
> > even if you are guessing as to cost. Shows you thought about it.
> >
> > -Contingency should be 50% not 30%. Also to keep in mind that with India
> > and China construction industry booming, civil engineering costs are
> > increasing rapidly (price of steel is rising for example).
> >
> > -He says you can get rid of the precast liner (I thought you already did)
> > you dont need it in this hard rock. Plastic liner is sufficient.
> >
> > -In the labor and benefits - did you take into account that you are no
> > longer in an operating mine? That means you have to pay all the
> > labour/benefit cost for the miners. When Mark DiLaurenti made his estimate
> > of labour costs, Homestake was operating and you wouldnt have needed to
> > pay for all the overhead for the miners. Now you do.
> >
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